Objective 1	**Ensure no significant risk to public health, safety and resources, and tribal archaeological and cultural resources from forest-management-related mass-wasting events.**
Mass-wasting	***Strategies:*** • *Timber harvest and road construction upon potentially unstable slopes (as defined in the "Slope Stability Assessment" and shown generally on Map G-2 "Potentially Unstable Slopes") shall be carefully regulated.* o *Proposed activities on potentially unstable slopes shall be reviewed by the inter-jurisdictional committee who may make site specific recommendations.* o *Proposed activities on potentially unstable slopes will require on-site evaluation by a DNR specialist to determine actual unstable areas.* o Potentially unstable slopes determined to be "unstable" based on this evaluation: • *No road construction or timber harvesting will occur on areas identified during the above evaluation as unstable.* • ~~Road reconstruction on areas identified by the above evaluation as unstable will consider *inter-jurisdictional committee and* specialists recommendations. Almost~~ *No* road reconstruction should occur on unstable slopes. • Leave a *200-foot* ~~140-foot~~ *no-harvest* edge buffer adjacent to areas identified as unstable. • ~~Allow 20% thinning removal in the outer 50 feet of this edge buffer.~~ o Potentially unstable areas not found to be "unstable" based on this evaluation (but shown on Map G-2) • *No timber harvest (full retention) on potentially unstable slopes.* ~~Allow thinning removals that retain over 50 percent of the timber stand by basal area on potentially unstable slopes.~~ • ~~Almost~~ *No* roads will be located on potentially unstable slopes. o ~~*Timber harvesting or road construction outside of identified unstable areas, but within the mapped "potentially unstable slopes", will consider inter-jurisdictional committee and specialists recommendations.*~~ • *Slope stability assessment work generally identified "high hazard" and "moderate hazard" mass-wasting units (See Map G-1) within the potentially unstable slopes areas. Watershed Analysis Areas of Resource Sensitivity #1 is rated "moderate hazard"; ARS #2, 3 and 4 are rated "high hazard."* o *Proposed activities on potentially unstable slopes shall be reviewed by the inter-jurisdictional committee, which may make site-specific recommendations.* o Follow Lake Whatcom Watershed Analysis mass-wasting prescriptions relating to timber harvesting. • In addition, leave a *200-foot* ~~140-foot~~ *no-harvest* edge buffer adjacent to ARS #1, 2, 3 and 4. • ~~Allow 20% thinning removal in the outer 50 feet of this buffer.~~ o *On unstable slopes in ARS* #1, *#2, #3 and #4 or areas identified as unstable above, new road construction and road reconstruction shall be prohibited ~~and old road reconstruction shall be limited.~~* ~~o *Follow Watershed Analysis prescription for road construction in ARS #1.*~~ ~~o *Existing road reconstruction will follow Watershed Analysis road construction prescriptions in ARS #1, 2, 3 and 4.* Almost no road reconstruction should occur on unstable slopes.~~ • In Smith Creek, large woody debris, which increases the risk of log jams and resulting debris torrents, will be cut into chunks to reduce debris build up, to provide for public safety of downstream residents.[8]

[8] This strategy is based on a negotiated legal settlement between DNR and residents in this area.

Objective 2	**Maintain and restore the sediment regime within the range of natural variability**.
Roads & sediments	***Strategies:*** • Follow Forest Practice Rules and watershed analysis prescriptions for road construction and maintenance in those areas allowed under this alternative, with ~~one~~ *three* exceptions: o Stream crossings on ~~Type 1-4~~ *all* streams will only be allowed by concurrence with the inter-jurisdictional committee. o *Roads will be paved for 200 feet at the approach to existing stream crossings*. o *Bridges will be used for all new or replaced stream crossings on Type 1-4 streams.* o No road construction allowed *from October 15 through July 1*. ~~during "wet conditions" (typically Nov. 1 – March 31) unless the contractor can demonstrate that protection of resources can be provided.~~ o Minimize new road construction using harvest systems planning. • No timber and rock hauling ~~during "wet conditions"~~ on DNR forest roads without surfacing or surfaced with non-durable rock, where sediment has the potential to deliver to streams. • Develop and begin implementation of a road maintenance and abandonment plan based on the specifications in WAC-222-24-050 and 051, within one year of the completion and approval of the landscape plan. o All orphaned roads will be inventoried and assessed relative to risk of failure and/or potential for sediment delivery. Mitigation work on orphaned roads will be done where a clear risk to public safety or potential for resource damage exists and accessing the site will not cause greater resource damage or public risk. o Treat (abandon and/or reduce to low risk) all roads and orphaned roads that are high hazard to public safety and resource damage within *two (2)* ~~three (3)~~ years of approval of the landscape plan.
Objective 3	**Protect and restore riparian and wetland habitat to sustain healthy native aquatic, wetland, and riparian ecosystems**.
RMZs	***Strategies:*** • Establish riparian management zones *along all streams* while planning management activities. Manage lands within such zones to protect water quality and riparian habitat. *Activities proposed within riparian management zones and wetlands shall be reviewed by the inter-jurisdictional committee, which may make site-specific recommendations.* o ~~Type 1, 2, and 3 waters shall have a designated riparian management zone with a minimum horizontal width (each side) equal to the 100-year site potential tree height or 100 feet, whichever is greater; timber harvest allowed per HCP and forestry handbook procedures. [Current procedures do not allow harvesting within riparian buffers. However, the HCP agreement anticipates that some harvesting will occur: (a) No timber harvest within the first 25 feet horizontal distance from the outer margin of the 100-year floodplain; (b) the next 75 feet of the riparian buffer shall be a minimal harvest area, and (c) the remaining portion of the riparian buffer shall be a low harvest area. The HCP provides performance goals for these three areas. Procedures to implement the HCP intent are still being developed.]~~ o Type 1 *through 4* ~~and 2~~ waters shall have a designated riparian management zone of 250 feet. o ~~Type 3 waters shall have a designated riparian management zone of 200 feet.~~ o Type 5 waters shall have a designated riparian management zone of 150 feet. ~~with a minimum horizontal width (each side) of 100 feet; timber harvest allowed per HCP and forestry handbook procedures.~~ o ~~*Type 5 waters shall have a designated riparian management zone with a minimum horizontal width (each side) of 33 feet.*~~ o *No timber harvests shall occur in* Type 1 though *5 riparian management zones except as needed for roads and yarding corridors*. Yarding corridors must constitute less than *two (2)* ~~five (5)~~ percent of the stream length. Only full-suspension yarding

	is allowed in these corridors. *Trees cut for yarding corridors through type 5 riparian management zones shall be retained as down wood*. o The riparian management zone distance will be measured horizontally from the outer edge of the 100-year flood plain. o The width of the riparian management zone shall be increased to include an outer wind buffer. ~~consistent with the HCP, on Type 1, 2, & 3 in areas prone to wind throw. Where there is at least a moderate potential for windthrow,~~ wind buffers shall be 140 feet wide *on each side of all riparian management zones*. ~~on all streams~~. ~~100 feet wide on Type 1 & 2 waters and 50 feet wide on Type 3 waters that are wider than 5 feet.~~ • *No timber harvest allowed in the wind buffer, except as needed for allowed roads and yarding corridors*. ~~Thinning up to 20 percent of the timber volume is allowed in the outer 50 feet of the wind buffer.~~
Wetlands	***Strategies (cont):*** • For all wetlands ¼ acre in size or greater, provide a buffer equal to the site potential tree height of a tree at age 200. • No timber harvest shall occur in the wetland *or in the buffer*. ~~nor in the first half (by distance) of the wetland buffer. Up to 20% timber thinning removal may occur in the outer half of the wetland buffer.~~ • For wetlands less than ¼ acre, clump leave trees in the wetland. ~~• Provide forested wetland buffers on wetlands consistent with HCP riparian management strategy.~~ ~~o For wetlands greater than 1 acre in size, provide a wetland buffer equal in width to the 100-year site potential tree height or 100 feet, whichever is greater.~~ ~~o For wetlands greater than 0.25 acre and less than one acre, provide a 100-foot wetland buffer.~~ ~~• Ensure that timber harvest in forested portions of wetlands and wetland buffers perpetuate a wind-firm stand with a minimum basal area of 120 square feet per acre.~~
Objective 4	**Maintain and restore the forest hydraulic regime for each sub-basin within the range of natural variability**.
Hydrologic maturity	***Strategies:*** • In each sub-basin, as these are defined in the Watershed Analysis, maintain at least *70 percent* ~~50%~~ of the timber (by area) in the sub-basin at greater than 60 years of age. ~~• Follow Lake Whatcom watershed analysis prescriptions relating to hydrologic maturity in rain-on-snow zones:~~ ~~o Maintain a minimum of (692) acres of hydrologically mature (> 40 years) forest in the Olsen Creek sub-basin.~~ ~~o Maintain a minimum of (1,200) acres of hydrologically mature (> 40 years) forest in the Smith Creek sub-basin.~~
Objective 5	**Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems**.
Chemicals	***Strategies:*** • Follow Forest Practice Rules and Forest Resource Plan Policy No. 33 (Controlling Competing Vegetation). Use the following prioritized application methods: 1) no treatment, and 2) non-chemical. ~~, and 3) ground-applied, and 4) Aerial-applied~~. No ~~aerially-applied~~ chemicals may be used (chemicals include dust abatement, insecticides, pesticides, or fertilizers). Select a cost effective method by considering the no treatment method first and *then other non-chemical treatment options*. ~~move sequentially down the list~~.

	• Follow Forest Practice Rules and Forest Resource Plan Policy No. 33 (Controlling Competing Vegetation) and 34 (Thinning, Fertilizing, and Pruning). Use prioritized application method listed in Strategy 5.1. No ~~aerially applied~~ chemicals may be used (chemicals include dust abatement, insecticides, pesticides, or fertilizers)
Objective 6	**Maintain and restore a diversity of natural and managed functional habitat conditions to benefit native fish and wildlife species, particularly those identified in WDFW priority and habitat species (PHS).**
Fish habitat	***Strategies:*** • Ensure all native fish species have access throughout their natural range at all life stages. o Identify, prioritize, and replace fish-blocking culverts with fish-passage structures. Replacement will occur during planned management activities or during implementation of the Road Maintenance & Abandonment Plan. Complete all this fish passage work within *two (2)* ~~three (3)~~ years after approval of the landscape plan.
Older-forest conditions	• Retain riparian and wetland buffers and off-base unstable slope areas in older forest conditions, letting those not in that condition yet to grow into it. • Manage the forest that is on-base for *200-year* ~~140-year~~ average rotation age.
PHS Species	• For all wildlife species and uncommon habitats that have guidelines stated within the Washington Department of Fish and Wildlife's Priority Habitats and Species Management Guidelines, inventory and protect all existing suitable habitat according to those guidelines. For those priority habitats and species that have no guidelines, consult with the DNR region, tribal, and WDFW biologist *and follow their concurred recommendations*. Habitats of concern include but are not limited to: o Bald eagle nesting, roosting and foraging sites. o Marbled murrelet habitat. o Common Loon o Northern Goshawk o Pileated Woodpecker o Cliffs o Talus Fields o Caves o Balds • Protect locally rare or uncommon native vegetative communities within the watershed that exhibit a combination of distinct age structure, species composition, structural diversity, or high wildlife value as identified in the assessment (e.g., the 100-year-old big-leaf maple stand). Determine protection measures by consultation with DNR region, affected tribes, and WDFW, *and follow their concurred recommendations*.
~~Bald eagles~~	~~• Protect all known bald eagle nesting, roosting and foraging sites.~~ ~~o Follow Forestry Handbook Procedure PR 14-004-330 for protecting bald eagle nest sites and roosts, including the development of site management plans for bald eagle habitat pursuant to Forest Practices Regulations (WAC 232-12-292).~~ ~~• Follow the HCP riparian and large, structurally unique tree retention strategies, which should result in increased abundance of large trees for bald eagle nesting and roosting.~~

~~Marbled murrelet~~ ~~Unlisted species of concern~~ ~~Uncommon habitats~~	• ~~Conduct Pacific Seabird Group (PSG) protocol surveys of all known reclassified marbled murrelet habitat to determine occupancy.~~ o ~~Protect occupied stands and develop a long-term conservation strategy for the North Puget Planning Unit, as required in the HCP.~~ • ~~Follow specific species-by-species Forestry Handbook procedures. The following unlisted species of concern have been identified in Table XX as existing in or near the Lake Whatcom landscape and have Forestry Handbook procedures in place. Where current procedures do not exist, consult with the Region wildlife biologist.~~ o ~~Common Loon – see Forestry Handbook Procedure PR 14-004-240: Protecting Common Loon Nests.~~ o ~~Northern Goshawk – see Forestry Handbook Procedure PR 14-004-260: Protecting Northern Goshawk Nests West of the Cascades.~~ o ~~Pileated Woodpecker – see Forestry Handbook Procedure PR 14-004-290; Protecting Pileated Woodpecker Nests.~~ • ~~Follow specific Forestry Handbook Procedures. The following uncommon habitats have procedures:~~ o ~~Cliffs – see Forestry Handbook Procedure PR 14-004-190: Protecting Cliffs.~~ o ~~Talus Fields – see Forestry Handbook Procedure PR 14-004-170: Protecting Talus Field.~~ o ~~Caves – see Forestry Handbook Procedure PR 14-004-180: Protecting Caves.~~ o ~~Balds – see Forestry Handbook Procedure PR 14-004-220: Protecting Balds.~~
Objective 7	**Permanently retain green trees, snags, & down logs to support mature forest functions**.
Snags, green trees, down wood	***Strategies:*** • Permanently retain *40 percent* ~~25%~~ of the trees by basal area in any harvest unit. o Emphasize retention of all existing snags, where safe and practicable. (These count toward the *40 percent* ~~25%).~~ o Retain all existing down logs. • ~~Implement the following snag and green tree retention procedures on all harvest units, consistent with PR14-006-090:~~ o ~~Retain seven (7) percent of all trees that are 12" dbh or larger or 8 trees per acre, whichever is greater, as permanent legacy trees.~~ o ~~Legacy trees shall be dominant and co-dominant trees~~ o ~~Legacy trees shall include at least five windfirm green trees and three snags per acre harvested (subject to Dept. of Labor and Industries safety standards)~~ o ~~Choose as legacy trees, large trees with structural characteristics important to wildlife and old growth remnants~~ o ~~One of these trees must be from the largest diameter class~~ o ~~One additional tree must be from the dominant crown class~~ o ~~Leave snags whenever safe and practicable. Retain snags that are at least 15"dbh and 30' tall. Give priority to large hollow snags, hard snags with bark, and snags that are at least 20" dbh and 40' tall.~~ o ~~If fewer than three snags per acre can be left, additional live trees will be retained so that the average per acre equals 7 percent or 8 trees per acre, whichever is greater.~~ ..
Objective 8	**Maintain or increase soil productivity and health**.
Snags Harvest methods	***Strategies:*** • Implement the strategies for snag and green tree retention above. • Select harvest methods that maintain or facilitate establishment of productive and healthy forest stands. • Avoid using ground-based harvesting systems on slopes exceeding 30% and on soils sensitive to compaction.

Objective 9	**Preserve, protect, and restore significant historic, archeological, traditional current use and cultural resources.**
	Strategies: • Identify and protect cultural resources using the following DNR policies, procedures, and guidelines, as well as state and federal acts, rules, regulations, accords, agreements, and executive orders. o **Implement DNR Policy P006-001 Historical, Cultural and Archaeological Sites, 7/31/96: "**All department personnel will identify potential archaeological, historic and cultural sites/resources in the course of their normal duties. Discovered resources will be recorded and inventoried in coordination with the Office of Archaeological and Historic Preservation (OAHP) and/or the appropriate Tribes so that they can be protected to the full extent allowable by law. o It is the policy of the department that Forest Resource Plan Policy #24 "Identifying Historic Sites," shall apply to all department managed lands. That policy states "The department will establish a program to identify and inventory historic and archaeological sites and protect them at a level, which, at a minimum, meets regulatory requirements…." o **DNR Tribal Policy PO06-002, Jan. 16, 1991** as referenced in Appendix F of the 1992 Forest Resource Plan, in PO06-001, and as reflected in the Revised DNR Tribal Policy, June 1998. o **1992 DNR Forest Resource Plan: Policy #8 "**Special Forest Products"; **Policy #13 "**Special Ecological Features"; **Policy #16 "**Landscape Planning"; **Policy #19 "**Watershed Analysis"; **Implement Policy #24: "**Historic and Archaeological Sites": "The department will establish a program to identify and inventory historic and archaeological sites and protect them at a level which, at a minimum, meets regulatory requirements." **Policy #28 "**Developing and Maintaining Roads"**; Policy #35 "**Implementation Policies: Public Involvement": **"**The department will solicit comment from the public, tribes, and government agencies when implementing the Forest Resource Plan and when revising policies contained in the document." o **DNR Forestry Handbook Procedures:** PR 14-004-030 "Identifying Historic Sites"; PR 14-004-010 "Identifying Off-base Lands"; PR 14-004-110 "Wetland Management". o **DNR Final Habitat Conservation Plan** (September 1997) and by reference: **(1) DNR DEIS** (March 22, 1996), 4.9 Cultural Resources, pgs. 4-525-4-528; and **(2) DNR HCP FEIS** (October 25, 1996), p. 3-121 C. Cultural. o **Washington State Rules, Regulations, Agreements:** RCW 27.34 Archaeological and Historic Preservation**;** RCW 27.44 Indian Graves and Records; RCW 27.53 Archaeological Sites and Resources Act; RCW 43.21C.020 & WAC 197-11 State Environmental Policy Act; RCW 25 Office of Archaeology and Historic Preservation; RCW 76.09 Forest Practices Act; WAC 222 Forest Practices Rules; 1999 Forest & Fish Plan Appendices G: Cultural Resource Module, N2: DNR Cultural Resources Planning, O:Cultural Resources Management & Protection Plan; 1987 TFW Agreement; 1989 Centennial Accord. o **Federal Regulations/Laws/Executive Orders:** 36 CFR Part 800 Protection of Historic Properties; 42 U.S.C. AIRFA American Indian Religious Freedom Act; 33 U.S.C Clean Water Act; 16 USC Endangered Species Act; Title 16 U.S.C 1906 Antiquities Act; Title 16 U.S.C., PL 96-95 Archaeological Resources Protection Act of 1979; PL 101-601 Native American Graves Protection and Repatriation Act; PL 91-190 National Environmental Policy Act; as applicable to DNR HCP; 1971 Executive Order #11593 Protection and Enhancement of the Cultural Environment. o **Lummi Nation Code of Laws Title 40 Cultural Resources Preservation Code; Lummi Resolutions 92-124 & 125** .

	• Use the DNR Planning and Tracking (P&T) System, which links the user to DNR's Total Resource Application Cross-Reference (TRAX) database system, prior to planning resource management activities to identify known Cultural Resources Sites, per DNR PR14-004-030 "Identifying Historic Sites". • DNR and the affected Tribes will develop a Cultural Resource Management Plan (CRMP), in consultation with the Office of Archaeology and Historic Preservation, that implements the Protection Needs and Comments/Recommendations columns in the Cultural Resource Matrix (Table5)[9], the 1987 Timber, Fish, and Wildlife Agreement on Archaeological and Cultural Resources, and DNR policy P006-001. The CRMP will be completed and implemented within 1-year following adoption of the landscape plan. o When management activities involve or affect cultural resources, DNR will meet with the affected tribe(s) with the objective of agreeing to a plan for protecting the archeological or cultural value. (per WAC 2222-20-120) • Prior to implementation of the completed CRMP, DNR will consult with affected Tribes during timber harvest planning, as specified in a MOU, MOA, or other formalized agreement signed by DNR and the affected Tribes prior to implementation of the landscape plan. Protection of Traditional Cultural Properties identified during timber harvest planning will follow the Protection Needs and Comments/Recommendations columns in the Cultural Resource Matrix (Table5). o DNR will meet regularly with the affected tribe(s) to discuss plans or management activities per PO06-002 Tribal Relations Policy, January 16, 1991 and June 2, 1998)
Objective 10	**Provide and facilitate tribal access to state managed lands for traditional cultural and religious practices and treaty guaranteed hunting and gathering.**
Tribal access	***Strategies:*** • ~~Tribal use is provided for by Policy No. PO10-002 (Public Use on DNR-Managed Trust Lands), provided resources and assets are not at risk.~~ Tribal access for hunting, fishing and gathering per Point Elliott Treaty of 1855 Section 5 Open and unclaimed lands. o Prior to implementation of the landscape plan, develop a Memorandum of Understanding (MOU) with affected Tribes regarding physical access for tribal members to state managed lands for traditional cultural and religious practices, and tribal ceremonial gathering and hunting. o Include Tribes in pre- and post- harvest planning, provide information sharing and access to do traditional practices. Consult with Tribal staff during the development of the Lake Whatcom road maintenance and abandonment plan.
Objective 11	**Create and implement a sustained yield model specific to the Lake Whatcom watershed that encompasses the revised management standards and that is consistent with the sustained yield established by the Board of Natural Resources.**
	Strategies: • ~~The average rotation age is consistent with Forest Resource Plan policy as specified by site and species – generally averaging 60 years.~~ • Forest management rotation age will average *200 years* ~~140 years.~~ • Harvest trees in dense stands (commercial thinning), before trees die from stand competition, to capture revenue that would otherwise be lost.
Objective 12	**Maintain or improve commercial forest productivity and health.**
	Strategies: • Select a harvest method that maintains or facilitates establishment of productive and healthy forest stands. • Avoid using ground-based harvesting systems on slopes exceeding 30% and on soils sensitive to compaction.

[9] The Cultural Resource Matrix (Table 5) is located in Appendix D, Cultural Resource Assessment.

	• Following regeneration harvests, reforest with a majority of Douglas-fir intermixed with Western redcedar at all elevations in the planning area. Where appropriate, rely on natural regeneration. • Pre-commercially thin overstocked stands. • During the first two decades of the plan, accelerate the harvest of mature and over-mature hardwood stands on sites better suited for conifers. • Control competing vegetation that would dominate crop trees or significantly inhibit growth in a stand.
Objective 13	**Cultivate higher value commercial forest products**.
	Strategies: • Plant and encourage growth of western redcedar to develop pole products. • Prune, to increase wood quality, where it will generate a higher economic return. • Consider tree selection during commercial thinning that promotes future log quality.
Objective 14	**Develop and maintain a transportation network that facilitates commercial management activities**.
	Strategies: • Develop and begin implementation of a Road Maintenance and Abandonment Plan within one year of the completion and approval of the landscape plan. • Use harvest system planning to identify necessary roads and reduce the total length of new road construction. • Abandon roads to Forest Practices standards when they are no longer needed for management. • Install and maintain gates where necessary to reduce road maintenance costs, resource impacts, vandalism, and garbage dumping.
Objective 15	**Maintain and increase lease revenue from existing and future communication sites.**
	Strategies: • Continue to lease tower and building space to interested parties. • When possible, review rental rates. Increase rates if market conditions allow. • Seek new communication site customers.
Objective 16	**Consider opportunities to generate revenue from oil and gas exploration.**
	Strategies: • *No surface or exploratory drilling or seismic work in watershed.* • ~~Limit exploratory drill sites to surface locations outside the watershed. Subsurface diagonal drilling allowed.~~ • ~~If sufficient oil or gas reserves are found, allow development of the resource if compatible with other landscape objectives~~.
Objective 17	**Consider the marketing of special forest products such as evergreen boughs, salal greens, moss, and native plants, as appropriate.**
	Strategies: • Ensure potential products, if sold, will not negatively impact other resource objectives or traditional tribal use.
Objective 18	**Consider other revenue generating mechanisms.**
	Strategies: • Green certification • Carbon sequestration • Lease(s) • Conservation easement

	• Reconveyance • Exchange or sell trust lands *consistent with the respective alternative*. • Recreational fees.
Objective 19	**Manage dispersed, low impact recreation**.
	Strategies: • Public use and recreation is allowed in accordance with Policy No. PO10-002 (Public Use on DNR-Managed Trust Lands), provided resources and assets are not at risk. o Consult with tribal staff to ensure that the DNR's public use policy is consistent with Objectives 9 and 10. • As budget allows, develop a comprehensive recreation plan in cooperation with specific user groups such as the horseback riders, mountain bikers, hikers and other interested parties that minimizes impacts to trust resources and assets. • Limit access to streams, riparian areas, and wetlands by motorized vehicles through permanent road closures, vehicle barriers, and public education and enforcement.
Objective 20	**Reduce the visual impact of forest management activities in high visibility areas as shown on Map S-1.**
	Strategies: • Follow Forest Practice Regulations and Forest Resource Policy No. 32 (Green-up of Harvest Units), in conjunction with Policy No. 16 (Landscape Planning). • On all the state trust lands, including "moderate visibility" areas on Map S-1, the following guidelines will be used for even-aged harvest units: o Harvest units will not exceed 100 acres except in the case of emergency salvage operations due to extensive "blowdown", insect or disease infestation, or public safety concern. o No harvesting within 300 feet of another harvest area if combined acreage of harvest areas exceeds 100 acres o Harvest units with trees greater than 4 feet high are considered "greened-up." • In "high visibility" areas on Map S-1, the department will consider the size, shape, and location of harvest units and distribution of leave trees when planning timber sales.
Objective 21	**Support stewardship education opportunities and partnerships that address community needs.**
	Strategies: • Cooperate with and provide educational opportunities to requesting educational institutions and other interested parties consistent with the department's public use policy No. PO10–002. • DNR will continue to be an active participant in the Forest Practices Timber Fish Wildlife (TFW) process and the Lake Whatcom Forestry Forum.

Alternative 5[10]:

Alternative 5 is a restoration alternative that does not focus on revenue generation, although it identifies the need to consider alternative revenue sources. This alternative was developed by the Committee in response to comments received during the EIS scoping process. It is included here for comparative purposes. Alternative 5 will only be considered in the draft EIS if viable alternative revenue and funding mechanisms are associated with it.

The initial focus of this alternative is on accelerating the development of old forest conditions and/or important cultural vegetation through strategic restoration thinnings. Restoration thinning includes introducing species and structural diversity into previously managed stands through plantings and variable density silviculture treatments that also retain unthinned areas and include small open patches. The long-term goal would be to create a forest that achieves a general, dynamic balance so that no further silvicultural activities would be required.

- This alternative precludes:
  - most timber harvest, except restoration thinnings designed to accelerate the development of old forest conditions and/or important cultural vegetation;
  - all new road construction;
  - all road reconstruction, except where needed to carry out restoration practices; and
  - new communication lease sites.
- This alternative also limits public access to aquatic, riparian, and wetland areas to pedestrians only.
- Alternative 5 is not intended to meet the requirements of ESSB 6731 regarding consistency with the sustained yield established by the Board of Natural Resources (Objective 11). Although many of the strategies are the same as those in the previous alternative, Alternative 5 relies more heavily on Objective 18 regarding alternative mechanisms to generate revenue.

The following table describes only Alternative 5, without the background edits made in transition from Alternative 1 through Alternative 4 as provided in the earlier tables. (This was necessary because edits had begun to overshadow the text of the alternative.)

[10] All strategies must be consistent with appropriate cultural resources and tribal relations strategies under Objectives 9 and 10.

Objective 1	**Ensure no significant risk to public health, safety and resources, and tribal archaeological and cultural resources from forest-management-related mass-wasting events.**
Mass-wasting	***Strategies:*** • No timber harvest (full retention) on all unstable slopes. • No new road construction on any state trust lands in the planning area. • For potentially unstable slopes, as defined in the "Slope Stability Assessment" and shown generally on Map G-2 "Potentially Unstable Slopes"): o Proposed activities on potentially unstable slopes shall be reviewed by the inter-jurisdictional committee, which may make site-specific recommendations. o No road construction or timber harvesting will occur on either unstable or potentially unstable slopes in these areas. o No road reconstruction, except repair of active roads, should occur on unstable slopes. o Abandon moderate- to high-risk roads on potentially unstable slopes shown on these maps. o Leave a 200-foot no-harvest edge buffer adjacent to areas identified as unstable. • Slope stability assessment work generally identified "high hazard" and "moderate hazard" mass-wasting units (See Map G-1) within the potentially unstable slopes areas. Watershed Analysis Areas of Resource Sensitivity #1 is rated "moderate hazard"; ARS #2, 3 and 4 are rated "high hazard." o Proposed activities on potentially unstable slopes shall be reviewed by the inter-jurisdictional committee, which may make site-specific recommendations. o No harvest (full retention) on all unstable slopes (ARS #1, 2, 3 and 4). o Leave a 200-foot no-harvest edge buffer adjacent to ARS #1, 2, 3 and 4. o On unstable slopes in ARS #1, #2, #3 and #4 or areas identified as unstable above, new road construction shall be prohibited. Road reconstruction is also prohibited, except for repair of active roads. o Abandon moderate- to high-risk roads on these unstable slopes. • In Smith Creek, large woody debris, which increases the risk of log jams and resulting debris torrents, will be cut into chunks to reduce debris build up, to provide for public safety of downstream residents.[11]
Objective 2	**Maintain and restore the sediment regime within the range of natural variability**.
Roads & sediments	***Strategies:*** • No new road construction on any state trust lands in the watershed. • Road reconstruction allowed only for carrying out restoration practices. • Follow Forest Practice Rules and watershed analysis prescriptions for road reconstruction and maintenance with three exceptions: o Stream crossings on all streams will only be allowed by concurrence with the inter-jurisdictional committee. o Roads will be paved for 200 feet at the approach to existing stream crossings. o Bridges will be used for all new or replaced stream crossings on Type 1-4 streams. o No road construction allowed from October 15 through July 1. • No timber and rock hauling on DNR forest roads during "wet conditions" (typically Nov. 1 – March 31)

[11] This strategy is based on a negotiated legal settlement between DNR and residents in this area.

	• Develop and begin implementation of a road maintenance and abandonment plan based on the specifications in WAC-222-24-050 and 051, within one year of the completion and approval of the landscape plan. o All orphaned roads will be inventoried and assessed relative to risk of failure and/or potential for sediment delivery. Mitigation work on orphaned roads will be done where a clear risk to public safety or potential for resource damage exists and accessing the site will not cause greater resource damage or public risk. o Treat (abandon and/or reduce to low risk) all roads and orphaned roads that are high hazard to public safety and resource damage within two (2) years of approval of the landscape plan.
Objective 3	**Protect and restore riparian and wetland habitat to sustain healthy native aquatic, wetland, and riparian ecosystems**.
RMZs	***Strategies:*** • Establish riparian management zones along all streams while planning management activities. Manage lands within such zones to protect water quality and riparian habitat. Activities proposed within riparian management zones and wetlands will be reviewed by the inter-jurisdictional committee, which may make site-specific recommendations. o Type 1 through 4 waters shall have a designated riparian management zone of 250 feet. o Type 5 waters shall have a designated riparian management zone of 150 feet. o No timber harvests shall occur in Type 1 though 5 riparian management zones except as needed for road reconstruction, road maintenance, or yarding corridors. Yarding corridors must constitute less than two (2) percent of the stream length. Only full-suspension yarding is allowed in these corridors. Trees cut for yarding corridors through type 5 riparian management zones shall be retained as down wood. o The riparian management zone distance will be measured horizontally from the outer edge of the 100-year flood plain. o Wind buffers are not required since the only timber harvest that will occur adjacent to riparian management zones will be pre-commercial thinning (in stands less than 30 years old) and restoration thinning (in stands less than 60 years old)
Wetlands	***Strategies:*** • No timber harvest in any wetlands. • Wetland buffers will equal the site-potential tree height of a tree at age 200. • No timber harvest in wetland buffers.
Objective 4	**Maintain and restore the forest hydraulic regime for each sub-basin within the range of natural variability**.
Hydrologic maturity	*This objective does not require specific strategies for Alternative 5. The only timber harvest that will occur will be pre-commercial thinning (in stands less than 30 years old) and restoration thinning (in stands less than 60 years old).*
Objective 5	**Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems**.
Chemicals	***Strategies:*** • Follow Forest Practice Rules and Forest Resource Plan Policy No. 33 (Controlling Competing Vegetation). Use the following prioritized application methods: 1) no treatment, and 2) non-chemical. No chemicals may be used (chemicals include dust abatement, insecticides, pesticides, or fertilizers). Select a cost effective method by considering the no treatment method first and then other non-chemical treatment options..

	• Follow Forest Practice Rules and Forest Resource Plan Policy No. 33 (Controlling Competing Vegetation) and 34 (Thinning, Fertilizing, and Pruning). Use prioritized application method listed in Strategy 5.1. No chemicals may be used (chemicals include dust abatement, insecticides, pesticides, or fertilizers)
Objective 6	**Maintain and restore a diversity of natural and managed functional habitat conditions to benefit native fish and wildlife species, particularly those identified in WDFW priority and habitat species (PHS).**
Fish habitat Older-forest conditions	***Strategies:*** • Ensure all native fish species have access throughout their natural range at all life stages. o Identify, prioritize, and replace fish-blocking culverts with fish-passage structures. Replacement will occur during planned management activities or during implementation of the Road Maintenance & Abandonment Plan. Complete all this fish passage work within two (2) years after approval of the landscape plan. • Retain riparian and wetland buffers and off-base unstable slope areas in older forest conditions, letting those not in that condition yet to grow into it. *No "rotation age" was set for alternative 5, since the only timber harvest that will occur will be pre-commercial thinning (in stands less than 30 years old) and restoration thinning (in stands less than 60 years old). The latter will be designed to accelerate the development of old forest conditions.*
PHS Species	***Strategies:*** • Conduct only restoration thinning. The goal will be to accelerate the development of old forest conditions and/or important cultural vegetation. When designing thinnings, ensure the outcome will meet the following guidelines: o For all wildlife species and uncommon habitats that have guidelines stated within the Washington Department of Fish and Wildlife's Priority Habitats and Species Management Guidelines, inventory and protect all existing suitable habitat according to those guidelines. For those priority habitats and species that have no guidelines, consult with the DNR region, tribal, and WDFW biologist and follow their concurred recommendations. Habitats of concern include but are not limited to: o Bald eagle nesting, roosting and foraging sites. o Marbled murrelet habitat. o Common Loon o Northern Goshawk o Pileated Woodpecker o Cliffs o Talus Fields o Caves o Balds • Protect locally rare or uncommon native vegetative communities within the watershed that exhibit a combination of distinct age structure, species composition, structural diversity, or high wildlife value as identified in the assessment (e.g., the 100-year-old big-leaf maple stand). Determine protection measures by consultation with DNR region, affected tribes, and WDFW, *and follow their concurred recommendations*.

Objective 7	**Permanently retain green trees, snags, & down logs to support mature forest functions**.
Snags, green trees, down wood	***Strategies:*** *Since only pre-commercial and restoration thinnings will occur, leave trees are not addressed in Alternative 5.* • During thinning, emphasize retention of all existing snags, where safe and practicable. Retain all existing down logs.
Objective 8	**Maintain or increase soil productivity and health**.
	Strategies: • Restoration thinning only, with the goal of accelerating the development of old-forest conditions and/or important cultural vegetation. • Implement the strategies for snag and green tree retention above. • Avoid using ground-based harvesting systems on slopes exceeding 30% and on soils sensitive to compaction.
Objective 9	**Preserve, protect, and restore significant historic, archeological, traditional current use and cultural resources.**
	Strategies: • Identify and protect cultural resources using the following DNR policies, procedures, and guidelines, as well as state and federal acts, rules, regulations, accords, agreements, and executive orders. o **Implement DNR Policy P006-001 Historical, Cultural and Archaeological Sites, 7/31/96: "**All department personnel will identify potential archaeological, historic and cultural sites/resources in the course of their normal duties. Discovered resources will be recorded and inventoried in coordination with the Office of Archaeological and Historic Preservation (OAHP) and/or the appropriate Tribes so that they can be protected to the full extent allowable by law. o It is the policy of the department that Forest Resource Plan Policy #24 "Identifying Historic Sites," shall apply to all department managed lands. That policy states "The department will establish a program to identify and inventory historic and archaeological sites and protect them at a level, which, at a minimum, meets regulatory requirements…." o **DNR Tribal Policy PO06-002, Jan. 16, 1991** as referenced in Appendix F of the 1992 Forest Resource Plan, in PO06-001, and as reflected in the Revised DNR Tribal Policy, June 1998. o **1992 DNR Forest Resource Plan: Policy #8 "**Special Forest Products"; **Policy #13 "**Special Ecological Features"; **Policy #16 "**Landscape Planning"; **Policy #19 "**Watershed Analysis"; **Implement Policy #24: "**Historic and Archaeological Sites": "The department will establish a program to identify and inventory historic and archaeological sites and protect them at a level which, at a minimum, meets regulatory requirements." **Policy #28 "**Developing and Maintaining Roads"**; Policy #35 "**Implementation Policies: Public Involvement": **"**The department will solicit comment from the public, tribes, and government agencies when implementing the Forest Resource Plan and when revising policies contained in the document." o **DNR Forestry Handbook Procedures:** PR 14-004-030 "Identifying Historic Sites"; PR 14-004-010 "Identifying Off-base Lands"; PR 14-004-110 "Wetland Management". o **DNR Final Habitat Conservation Plan** (September 1997) and by reference: **(1) DNR DEIS** (March 22, 1996), 4.9 Cultural Resources, pgs. 4-525-4-528; and **(2) DNR HCP FEIS** (October 25, 1996), p. 3-121 C. Cultural. o **Washington State Rules, Regulations, Agreements:** RCW 27.34 Archaeological and Historic Preservation**;** RCW 27.44 Indian Graves and Records; RCW 27.53 Archaeological Sites and Resources Act; RCW 43.21C.020 & WAC 197-11 State Environmental Policy Act; RCW 25 Office of Archaeology and Historic Preservation; RCW 76.09 Forest Practices Act; WAC 222 Forest Practices

	Rules; 1999 Forest & Fish Plan Appendices G: Cultural Resource Module, N2: DNR Cultural Resources Planning, O:Cultural Resources Management & Protection Plan; 1987 TFW Agreement; 1989 Centennial Accord. o **Federal Regulations/Laws/Executive Orders:** 36 CFR Part 800 Protection of Historic Properties; 42 U.S.C. AIRFA American Indian Religious Freedom Act; 33 U.S.C Clean Water Act; 16 USC Endangered Species Act; Title 16 U.S.C 1906 Antiquities Act; Title 16 U.S.C., PL 96-95 Archaeological Resources Protection Act of 1979; PL 101-601 Native American Graves Protection and Repatriation Act; PL 91-190 National Environmental Policy Act; as applicable to DNR HCP; 1971 Executive Order #11593 Protection and Enhancement of the Cultural Environment. o **Lummi Nation Code of Laws Title 40 Cultural Resources Preservation Code; Lummi Resolutions 92-124 & 125** .
	• Use the DNR Planning and Tracking (P&T) System, which links the user to DNR's Total Resource Application Cross-Reference (TRAX) database system, prior to planning resource management activities to identify known Cultural Resources Sites, per DNR PR14-004-030 "Identifying Historic Sites". • DNR and the affected Tribes will develop a Cultural Resource Management Plan (CRMP), in consultation with the Office of Archaeology and Historic Preservation, that implements the Protection Needs and Comments/Recommendations columns in the Cultural Resource Matrix (Table5)[12], the 1987 Timber, Fish, and Wildlife Agreement on Archaeological and Cultural Resources, and DNR policy P006-001. The CRMP will be completed and implemented within 1-year following adoption of the landscape plan. o When management activities involve or affect cultural resources, DNR will meet with the affected tribe(s) with the objective of agreeing to a plan for protecting the archeological or cultural value. (per WAC 2222-20-120) • Prior to implementation of the completed CRMP, DNR will consult with affected Tribes during timber harvest planning, as specified in a MOU, MOA, or other formalized agreement signed by DNR and the affected Tribes prior to implementation of the landscape plan. Protection of Traditional Cultural Properties identified during timber harvest planning will follow the Protection Needs and Comments/Recommendations columns in the Cultural Resource Matrix (Table5). o DNR will meet regularly with the affected tribe(s) to discuss plans or management activities per PO06-002 Tribal Relations Policy, January 16, 1991 and June 2, 1998)
Objective 10	**Provide and facilitate tribal access to state managed lands for traditional cultural and religious practices and treaty guaranteed hunting and gathering.**
Tribal access	***Strategies:*** • ~~Tribal use is provided for by Policy No. PO10-002 (Public Use on DNR-Managed Trust Lands), provided resources and assets are not at risk.~~ Tribal access for hunting, fishing and gathering per Point Elliott Treaty of 1855 Section 5 Open and unclaimed lands. o Prior to implementation of the landscape plan, develop a Memorandum of Understanding (MOU) with affected Tribes regarding physical access for tribal members to state managed lands for traditional cultural and religious practices, and tribal ceremonial gathering and hunting. o Include Tribes in pre- and post- harvest planning, provide information sharing and access to do traditional practices. Consult with Tribal staff during the development of the Lake Whatcom road maintenance and abandonment plan.

[12] The Cultural Resource Matrix (Table 5) is located in Appendix D, Cultural Resource Assessment.

Objective 11	**Create and implement a sustained yield model specific to the Lake Whatcom watershed that encompasses the revised management standards and that is consistent with the sustained yield established by the Board of Natural Resources.**
	Alternative 5 is not based on timber harvest managed for sustained yield and revenue generation. See Objective 18 – other revenue generating mechanisms.
Objective 12	**Maintain or improve commercial forest productivity and health.**
	Strategies: *Alternative 5 is not based on managing for a commercial forest. The objective, instead, is to restore old-forest conditions through restoration thinning, and create a forest that will eventually be self-sustaining without harvest activities.* • During thinnings, avoid using ground-based harvesting systems on slopes exceeding 30% and on soils sensitive to compaction. • Pre-commercially thin overstocked stands.
Objective 13	**Cultivate higher value commercial forest products**.
	Alternative 5 is not based on cultivating higher value commercial forest products, so there are no strategies under this objective
Objective 14	**Develop and maintain a transportation network that facilitates commercial management activities**.
	Strategies: *Alternative 5 includes a transportation network to support restoration, not commercial activities.* • Develop and begin implementation of a Road Maintenance and Abandonment Plan within one year of the completion and approval of the landscape plan. • No new road construction. • Old road reconstruction only to support restoration activities. • Abandon roads to Forest Practices standards when they are no longer needed for management. • Install and maintain gates where necessary to reduce road maintenance costs, resource impacts, vandalism, and garbage dumping.
Objective 15	**Maintain and increase lease revenue from existing and future communication sites.**
	Strategies: • Continue to lease tower and building space to interested parties. • When possible, review rental rates. Increase rates if market conditions allow. • Seek new communication site customers on existing sites only.
Objective 16	**Consider opportunities to generate revenue from oil and gas exploration.**
	Strategies: • No surface or exploratory drilling or seismic work in watershed.

Objective 17	**Consider the marketing of special forest products such as evergreen boughs, salal greens, moss, and native plants, as appropriate.**
	Strategies: • Ensure potential products, if sold, will not negatively impact other resource objectives or traditional tribal use.
Objective 18	**Consider other revenue generating mechanisms.**
	Strategies: • Green certification • Carbon sequestration • Lease(s) • Conservation easement • Reconveyance • Exchange or sell trust lands *consistent with the respective alternative*. • *Recreational fees.*
Objective 19	**Manage dispersed, low impact recreation**.
	Strategies: • Public use and recreation is allowed in accordance with Policy No. PO10-002 (Public Use on DNR-Managed Trust Lands), provided resources and assets are not at risk. o Consult with tribal staff to ensure that the DNR's public use policy is consistent with Objectives 9 and 10. • As budget allows, develop a comprehensive recreation plan in cooperation with specific user groups such as the horseback riders, mountain bikers, hikers and other interested parties that minimizes impacts to trust resources and assets. • Pedestrian-only access to streams, riparian areas, and wetlands. Implement through permanent road closures, vehicle barriers, and public education and enforcement.
Objective 20	**Reduce the visual impact of forest management activities in high visibility areas as shown on Map S-1.**
	This objective is automatically met in Alternative 5 since the only timber harvest that will occur will be pre-commercial thinning (in stands less than 30 years old) and restoration thinning (in stands less than 60 years old).
Objective 21	**Support stewardship education opportunities and partnerships that address community needs.**
	Strategies: • Cooperate with and provide educational opportunities to requesting educational institutions and other interested parties consistent with the department's public use policy No. PO10–002. • DNR will continue to be an active participant in the Forest Practices Timber Fish Wildlife (TFW) process and the Lake Whatcom Forestry Forum.

Other alternatives considered and why they were eliminated from detailed study.

Recreation – Public comments were received that proposed developing the recreational potential of this area, and others that proposed reducing the role of recreation in this area. Since recreation planning was not a primary need behind creating a Lake Whatcom Landscape Plan, the Department chose not to pursue changes in its recreation program at this time.

3.3 Preliminary Summary and Comparison of Alternatives

No Action (Alternative 1) (3.3.1)

Areas of state trust lands specially constrained under Alternative 1 are shown on Map 1a..

Alternative 1 (No Action) incorporates the Department's existing policies, procedures, legal requirements and management commitments, including but not limited to the Forest Resource Plan, Forest Practices Rules and Habitat Conservation Plan. This alternative is also consistent with the Tier 3 alternative identified in DNR's statewide sustainable harvest calculation.

Earth: Road construction and timber harvest have the potential to create localized debris slides, with associated impacts, and increase the amount of water entering soils (under specific conditions), which could trigger slope failures and carry sediments. However, these potential impacts are substantially mitigated not by only DNR's policies and procedures, DNR's HCP, and the Forest Practices Rules, but also by the regulatory Watershed Analysis prescriptions completed specifically for Lake Whatcom watershed. These prescriptions are designed to prevent or avoid slope failures that would impact water quality or fish resources. Some short-term increases in sediment production will occur, regardless of mitigation. No probable significant impacts related to slope stability or surface erosion are expected under this alternative.

Air: Timber harvest, silvicultural activities and road building may create short-term, localized dust and/or occasional, short-duration, localized smoke plumes. No significant impacts.

Water: Timber harvesting has the potential to affect water quality in respect to sediment, temperature and nutrients. The watershed analysis, lumping all ownerships, indicates sediment yields are above background levels, shade requirements are not being met on about 25% of the stream miles, and nutrient concentrations are low. The data is not immediately amenable to separating out state trust lands, but it can be assumed that improvements are needed at some level in all three categories. As the HCP, recent changes to Forest Practices Rules,

and the Watershed Analysis prescriptions begin to affect and change the forest conditions over time, all three of these should improve where needed and be maintained at desired levels. In addition, harvest can directly increase water yield, increasing peak flow events. While some marginal increase in water yield is unavoidable, watershed analysis prescriptions and harvest system planning should mitigate the potential for negative impacts.

Plants and Animals: Approximately 50 years from the present, the landscape will have transformed from a forest ecosystem in which the dominant forest development stage is 40-70 years old, to one in which the dominant age class is over 70 years. In 100 years, the percentage of forest over 150 years old will increase from today's approximately one percent of the landscape planning area to about 30 percent. At the same time, the presence of young forest stands will decrease, due to the low number of acres harvested each year. There is no identified risk to rare or sensitive plants.

A long-term, overall trend that would be common to all of the alternatives would be for wildlife species abundance and diversity to vary over time, as the result of naturally-occurring vegetative succession. Succession would eventually favor species associated with older forest conditions, while dramatically reducing species associated with early seral stages and, to a lesser extent, mid seral stages. This would ultimately result in a reduction in "biodiversity" on the landscape level, even if site-specific, within-stand diversity increases. [See Section 4 for more discussion of diversity.] The temporal and spatial scale at which this would occur is the key difference between the alternatives. See Table X5, Appendix D for the percentages of each seral stage on the landscape over time for each alternative

Alternatives 1-4, as currently written, would result in a relatively rapid reduction of mature hardwood stands on the landscape. This would decrease habitat for many neotropical migratory birds and other species that are associated with hardwood stands for feeding, breeding, and/or life requirements.

Riparian and wetland ecosystems are largely protected by the HCP, forest practices rules and the Watershed Analysis. Forested wetlands under a quarter acre and riparian areas along Type 5 streams are not given special protection. Some protection is provided to Type 5 waters, however, through unstable slope protection. There may be adverse impacts to fish habitat due to the lack of riparian protection on the remaining Type 5 waters; this is being studied as part of DNR's HCP agreement.

Alternative 1 results in approximately 10 miles of new road over 10 years time, and about 61 miles until the full road system is built. The number of miles of road to be abandoned will be determined after completion of a Road Maintenance and Abandonment Plan. Roads can permanently alter the forest's functionality for wildlife, bringing increased human disturbance, habitat fragmentation, and a

decrease in habitat suitability for interior forest species. The portions of the planning area that would be most significantly impacted by road construction would include the middle-western portion, on Lookout Mountain, where there is currently contiguous mature forest with few roads. A relatively unroaded area in the southwestern portion would also be impacted.

Annual mortality and growth-losses due to forest insects and disease in the Lake Whatcom landscape is currently fairly low. Alternative 1 provides the most capacity for preventing and responding to epidemics, while also emphasizing the positive role disease and insects can play in correcting snag and coarse woody debris deficiencies.

Energy Resources: While the potential for future coal development within the landscape planning area exists, there currently is little demand or interest in this resource. Oil and gas lease requests are limited; recent oil and gas leases have required directional drilling from non-trust parcels. No current or potential hydropower.

Minerals: Direct impacts from sand, gravel and rock pits are minimal, currently, only one noted borrow pit[13] occurs on DNR-managed land within the landscape planning area. Gravel and rock resources on DNR managed lands are not particularly desirable for construction materials. The potential for commercial gravel or sales and operation on state land is very limited. There are no known or reported metallic mineral deposits or occurrences in or near the Lake Whatcom management area. Commercial development of Bentonite clay and other glacial clay deposits is unlikely, due to the quality of material.

Timber Resources: Seventy-two percent of the state trust lands in the landscape are available for commercial timber harvest. Sufficient acreage and volumes would be available to support the immediate harvest operations. Options for access to stands is greatest which also provides for the most opportunity to select a method of logging. This alternative provides the most acreage available for the harvesting of special forest products. Vehicular access to harvest sites would be maximized under this alternative, in the absence of gates. See Table 7 on the next page regarding cumulative impacts.

Carbon Sequestration: Alternatives 1, 2, 3 & 4: The level of harvests and length of harvest rotations proposed under each of these alternatives could provide significant opportunities for active net removal of atmospheric carbon and act as long-term carbon sequestration pools. Harvested trees that are turned into long-lasting products, such as lumber, would continue to sequester carbon. Regenerated harvest areas would provide younger trees that more actively remove and sequester atmospheric carbon.

[13] Small local site that is a source of fill material such as dirt or gravel.

Environmental Health: No significant adverse health impacts were identified. There is risk to downstream structures and residents on alluvial fans from debris-flow events. While DNR mitigates for harvest and road-building activities, such debris-flow events are part of the natural system and will not be eliminated.

Table 7: Timber Resources - Cumulative impacts of each alternative on the availability of acreage open to commercial harvests, average annual harvests per decade, average harvest volumes per acre, and the annual acreage treated as regeneration, thinning, and partial cut harvests.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Acres available for harvest or restoration activities that are not significantly constrained by management strategies*:	11,222	8,016	5,133	3,740	2,044
Percent of 15,657-acre planning area	72	51	33	24	13
Draft average annual harvest per decade (mbf/year)	5,511	2,733	492	428	N/A
Draft average Harvest Volume (mbf/acre)	37	30	9	16	N/A
Draft annual acreage treated as regeneration harvests	89	43	0	0	N/A
Draft average annual acreage treated as thinning harvests	47	35	18	16	N/A
Draft annual average acreage treated as partial cut harvests	11	13	11	9	N/A

in this table are approximate, resulting from modeling analysis, and used for comparative evaluation for planning purposes only. (Source: Road Summary, Stuart, 2002; Comparison of February 02 Sustainable Harvest Model Run, Brodie, 2002.)

Land and Shoreline Use: While many of the other provisions (e.g., riparian areas, unstable slope protection, etc.) will soften the visual impacts of harvest, some aesthetic impacts will occur. Site-specific design features could be added to help mitigate for this. No change is expected relative to dispersed recreation experiences on state trust lands in the landscape. At present, known archaeological and historic sites that are recorded with OAHP receive more protection than non-recorded and unknown sites under Alternative 1; all other sites are at some risk of damage.

Relative to use of forest resources, this alternative supports all silvicultural activities as allowed by federal and state laws, Forest Resource Plan policies, the Habitat Conservation Plan, and other Board of Natural Resources approved policies and management guidelines.

Transportation: The amount of road construction in each decade, under Alternative 1, would depend on the length of time planned for all timber harvest to occur. Assuming it takes 60 years for all stands to be harvested under this alternative, this would result in roughly 10 miles of new roads being built in the first decade. As indicated above, approximately 61 miles of new road would be constructed before the full transportation system is in place. The number of miles of road to be abandoned will be determined after completion of a Road Maintenance and Abandonment Plan.

Portions of Section 4 discuss the potential impacts of roads on mass-wasting, sediment delivery, fish habitat, wildlife habitat, etc. However, DNR's HCP and forest practices rules include extensive requirements related to road construction and maintenance in order to mitigate these potential impacts; many of the environmental benefits of these new requirements have not had time to play out on the landscape. Road maintenance and abandonment work will reduce the risk of environmental damage. This alternative provides the greatest flexibility for a transportation system that meets a variety of management requirements. Traffic safety issues, from truck traffic on neighborhood public streets, would be limited and localized.

Public Services & Utilities: Revenues from these lands support public services and facilities construction, including local fire districts, and K-12 school construction fund. Alternative 1 dedicates over 50 percent of the land's productive capacity for ecological and social benefits (Hulsey, 2002; see Appendix D). This alternative allows for some growth in communication site leases. The alternative does not affect police, recreational facilities, water/storm water management, sewer/solid-waste management or other government services or facilities.

Alternative 2 (3.3.2)

Areas of state trust lands specially constrained under Alternative 2 are shown on Map 2a.

Alternative 2 adds the legislative requirements in ESSB 6731 to the Alternative 1 (No Action). These additions relate primarily to unstable slopes, riparian areas and wetlands, with the focus on protecting water quality beyond the requirements of Ch.90.48 RCW, Washington's Water Pollution Control Act.. The analysis summary below only addressed those topics where meaningful differences are expected.

Earth: The potential for impacts to slope stability from road construction is greatly reduced under this alternative because no road construction will occur on unstable slopes and an estimated 0.1 mile of road construction on potentially unstable slopes is anticipated over approximately 60 years. The nature of the impacts would be similar to Alternative 1. The probability of slope failures occurring is also further reduced by the reduction of regeneration harvest acres. Surface erosion from exposed slopes associated with road construction would be reduced under this alternative due to the reduction by one third of the amount of new road construction.

Water: Perennial streams (Type 5 waters) will have more protection for water temperature. However, many of these streams are seasonal and are dry in the summer when water temperature is a concern. The buffers will help to reduce the amount of sediment entering the streams during and immediately following logging by preventing soil disturbance within the riparian areas. If there is a surface erosion source near a stream, the buffers will serve as a sediment filter.

Overall, the risk of adding more sediment to surface waters because of mass-wasting is reduced to some extent. Increases in water yield and peak flows will be slightly less. Alternative 1 is already unlikely to adversely affect the public water supply. (See letters from the departments of Ecology and Health, Appendix D, PDEIS7 and PDEIS8.) However, the risk of sediment and phosphorus loading above natural background levels into Lake Whatcom is less under this alternative than under the Alternative 1.

Plants and Animals: In the first ten years, there is little appreciable difference between Alternative 2 and Alternative 1 in terms of the existing ratios of forest stand conditions. At about 50 years, differences between Alternatives 1 and 2 become more readily apparent as more of the forest moves into more mature stands, and less of the forest is in younger age classes. At 100 years, the differences are more striking.

Short-term direct impacts of Alternative 2 to wildlife habitat would be similar to those of Alternative 1, with the exception of fewer road impacts (since road construction and regeneration harvest would be limited or restricted in more areas of the planning area). Long-term, Alternative 2 retains more undisturbed areas for older forest interior species, while resulting in a greater reduction of younger seral stage habitats required by some species.

The same species-by-species protection identified under Alternative 1 applies to Alternative 4. It can be noted that, as one progresses from Alternative 1 to Alternative 5, there is less potential over time for disturbance to occur at or near significant roosting sites or maternity colonies for Townsend's big-eared bats (or any of the Myotis species), due to an increase in "potentially inaccessible areas".

Riparian ecosystem function throughout the river continuum is more completely protected under Alternative 2 than under Alternative 1 due to the addition of RMZ protection for Type 5 waters, and added wind buffers. Alternative 2 provides greater short-term and long-term protection of amphibian habitat associated with Type 5 waters, as well as fish.

Timber Resources: Sufficient acreage and volumes would be available to support immediate harvest operations. Lack of vehicular access to some areas will reduce options for method of logging in areas. Some portions of the project area will be inaccessible to harvest, as landings suitable to helicopter operations will not be available. The average site index of lands available for harvest would be slightly reduced. Stands dominant with Douglas-fir will continue to be maintained. The availability of red alder of commercial size will decrease over time and stands with higher levels of hemlock and cedar will increase. See Table 7 under Alternative 1 for cumulative effects to the timber resources.

Land and Shoreline Use: Alternative 2 reduces the risk of slides, floods and debris-flows associated with management activities through the avoidance of more areas rather than risk-assessed design decisions. Aesthetic impacts will be reduced in some areas due to added riparian buffers and potentially unstable slope protection. Cultural resource protection is similar to Alternative 1; however, the additional protection of riparian and wetland areas and reduction of roads will reduce the potential short- and long-term impacts to ritual bathing, spirit quest and traditional song places, ceremonial flora/medicine sites, and gear storage sites.

Transportation: If it took 60 years for the first rotation of all timber harvest to be completed under this alternative, about 7 miles of new roads would be built in the first decade. Approximately 39 miles of road would be constructed overall to completed the transportation system for commercial forestry. The number of miles of road to be abandoned will be determined after completion of a Road Maintenance and Abandonment Plan. No new road construction on unstable slopes may reduce maintenance or special design costs; however, it may also result in longer road miles in some areas to reach harvest areas. It may also impact easements for neighboring landowners.

Public Services & Utilities: Revenues from these lands support public services and facilities construction. Alternative 2 dedicates 75 percent of the land's productive capacity for ecological and social benefits (as compared to over 50 percent in Alternative 1). (Hulsey, 2002.) This will impact local fire districts, counties and school construction. Gaining alternative revenue from carbon sequestration, green certification and/or recreational leasing appears unlikely to replace these funds.

Alternative 3 (3.3.3)

Areas of state trust lands specially constrained under Alternative 3 are shown on Map 3a.

Alternative 3 was developed by the Committee as the first of two options to Alternative 2. It was developed to provide a range of options to be considered, not as a Committee-preferred alternative. Alternative 3 differs from Alternative 2, primarily by: (1) adding wider buffers adjacent to unstable slopes, riparian areas, and wetlands; (2) limiting harvest in some areas to no harvest, or to thinning only; (3) further limiting road construction locations and stream crossings allowances; (4) setting time limits for treating high-risk roads and fish blockages; (5) increasing riparian zone and riparian buffer widths; (6) increasing the percent of the forest that must be hydrologically mature in each sub-basin; (7) increasing the average rotation age; (8) limiting chemical application options; (9) expanding on HCP guidelines for managing wildlife habitat to incorporate WDFW PHS management guidelines; (10) increasing snag and green tree retention; (11) not allowing surface drilling for oil and gas; and (12) adding a Cultural Resource Management Plan, and interim Memorandum of Understanding with Tribes. The analysis summary below only addressed those topics where meaningful differences are expected.

Earth: The overall impacts on slope stability would be less than either Alternative 1 or 2. Surface erosion from exposed slopes associated with road construction would be further reduced under this alternative. The cumulative impacts from implementation of this alternative would be reduced from Alternative 1, but would be only minimally different from Alternative 2.

Water: The risk of sediment from erosion of roads entering surface waters is less than under Alternative 1 or 2. There is also less chance of destabilizing a potentially unstable slope and the risk of mass wasting is also less. Because the buffers for Alternative 2 are sufficiently wide enough to provide adequate shade and filtering capacity, there will be no additional benefit to surface water quality. The risk of introducing chemicals directly into surface waters is all but eliminated. The risk of significantly increasing peak flows associated rain-on-snow events is less than under Alternative 1 or 2. This is especially true for Smith and Olsen Creek. For sub-basins entirely in the rain-dominated zone, the reduction in risk is minimal. The risk of sediment and phosphorus loading above natural background levels into Lake Whatcom is slightly less under Alternative 3 than under Alternative 2. Over time, the average water yield delivered to Lake Whatcom will be less than Alternative 1 or 2. However, neither Alternative 1 nor 2 are likely to adversely affect the public water supply.

Plants and Animals: The trend toward more acres of mature forest and fewer of young forests continues, occurring faster than either Alternative 1 or 2. Alternative 3 would decrease the short-term direct and indirect impacts listed under Alternative 1 even more than Alternative 2 would, since a substantially larger area of the planning area would be restricted from harvest and/or road-building activities. The change in forest composition would benefit interior old-forest species but reduce habitat for species using young forest and edge habitats.

This shift in the forest would also make the forest more prone to insect and disease activity. Alternative 3 will indirectly reduce commercial productivity and options by preventing aggressive treatments to improve stand vigor and reduce structures that are conducive to forest insect and disease activity. However, the ecosystem is not threatened.

Because harvest would consist of heavy thinning rather than regeneration harvests, structural diversity in harvested areas would increase compared to Alternative 1. Reduced frequency of entries should result in less soil compaction and allow vegetation communities to regrow between activities.

Alternative 3 is significantly more protective of riparian ecosystem and wetland functions than either Alternatives 1 or 2. Restrictions on yarding across streams and construction of stream crossings would further protect wetland and riparian soils and vegetation from mechanical disturbance.

Timber Resources: Alternative 3 leaves 33% of the project area available to harvest. The annual harvest volume is less than 10% of Alternative 1. The immediate ability to begin harvest operations will be delayed until sufficient acreage and volume is available to cover costs of logging, new road construction, reconstruction, layout and administration costs. Very poor access and limitations on regeneration harvests limit options for logging equipment. Increasing retention levels increases all operational costs because of higher complexity to sale layout and logging, costlier logging methods, and higher levels of road construction. (Burns, et al 1983). Some areas would be inaccessible to harvest, as landings suitable to helicopter operations would not be available. Thinnings in helicopter terrain may also not be economically feasible. A high reduction in average site index for lands available for harvest will occur with subsequent reductions in yields per acre. Also, the volume of retention trees will increase shade, favoring shade-tolerant species. See Table 7 under Alternative 1 for cumulative effects to the timber resources.

Alternative 3 limits vehicular access to large portions of the project area and with moderate impacts to the ability to economically harvest special forest products. The quantity and quality of different products will change in response to the changing character of the forest.

Environmental Health: Additional protection of potentially unstable slopes may reduce the risk of management activities causing destructive debris-flow events that might damage or destroy roads, structures, water systems, and other facilities would be reduced. However, such debris-flows will still occur occasionally, as natural events, even if no management activity occurs in the area.

Land and Shoreline Use: Visual impacts will be less likely due to reduced harvest and more of the area remaining forested. For cultural resources, Alternative 3 is basically the same as Alternatives 1 and 2. However, full establishment of the cultural resources program is likely to move forward more quickly because this alternative commits the department to developing a Cultural Resource Management Plan with the affected Tribes within 1 year of adopting the landscape plan. Additional cultural resource properties would be incidentally protected through increased natural resource preservation. Options for choosing silvicultural systems are reduced; the ability to control stand structure, stand composition and density, control rotation length, facilitate harvesting, and maximize timber yields are reduced compared to Alternative 1.

Transportation: Since the harvest rotation is increased from 60 to140 years, road construction should be spread out over a longer period, as well. If construction occurs evenly over the 140 years, there would be about 2 miles of new roads built in the first decade. Approximately 30 miles of new road would be constructed overall to complete the road system. The number of miles of road to be abandoned will be determined after completion of a Road Maintenance and Abandonment Plan.

Public Services & Utilities: Alternative 3 dedicates 90 percent of the land's productive capacity for ecological and social benefits (compared to over 50 percent in Alternative 1). (Hulsey, 2002.) This will impact the revenue to local fire districts, counties and school construction.

Alternative 4 (3.3.4)

Areas of state trust lands specially constrained under Alternative 4 are shown on Map 4a.

The Committee developed Alternative 4 as a second alternative to Alternative 2. Like Alternative 3, it was intended to provide a range of options to be considered, and was not developed as a Committee-preferred alternative. Alternative 4 sets still higher percentages, wider buffers, etc. These differences primarily include (1) setting wider buffers on unstable slopes and riparian areas, and adds buffers to smaller wetlands; (2) requiring wind buffers on all riparian management zones; (3) allowing less harvest within buffers; (4) limiting road reconstruction on unstable slopes; (5) setting more stringent stream crossing design requirements; (6) prohibiting yarding corridors in riparian areas; (7) setting a higher percentage for the amount of forest that must be hydrologically mature in each sub-basin; (8)

further increasing the average rotation age; (9) setting tighter restrictions on hauling seasons; (10) reducing the time allowed to treat high-risk roads and fish blockages; (11) disallowing chemicals for vegetation control, fertilization, pest and disease control, and dust abatement; (12) requiring concurrence among specialists for decisions about habitat protection; (13) further increasing the percentage of trees to be retained in harvest units; and restricting exploratory drilling and seismic work. The analysis summary below only addressed those topics where meaningful differences are expected.

Earth: The overall impacts on slope stability from road construction would be similar to Alternative 3. The probability of slope failures due to loss of root strength is reduced to a very low level as well. Impacts from rain-on-snow induced instability due to increases in soil-water would be essentially eliminated. Surface erosion from exposed slopes associated with road construction would be somewhat less than Alternative 3. The cumulative impacts from implementation of this alternative would be much reduced from Alternative 1, but would be only minimally different from Alternative 2 or 3.

Water: Paving the approaches will significantly reduce the sediment contribution from roads. Alternative 4 does not allow the use of chemicals, reducing the risk of human error in application; so there is no potential for these to impact surface water quality. Sediment loading will be a few percentage points less for Alternative 4 than for Alternative 3. Water yields into Lake Whatcom will also be less.

Plants and Animals: In 200 years from plan inception there would still be less than 2% difference in the stand development stage ratios between Alternatives 3 and 4. The main long-term difference would be the increased size of riparian buffers; much of whose area will encompass uplands and allow mature characteristics to develop along stream corridors. Likely to be more structural diversity in harvested units. This alternative, like Alternative 3, promotes an older forest ecosystem, rather than a highly diverse pattern of different seral stages.

The realized impact to wildlife will vary, with the greater positive impact to interior forest species and mobile mammals that may use riparian/forest "corridors" for travel across the landscape. This increase in buffer size is not likely to provide significantly greater protection for amphibians or other animals associated with the immediate riparian zone. However, it would be expected to allow for the development of even more snags, downed wood, and other characteristics of late-seral stands over the landscape. More information about timing, location and design of individual activities would be needed to determine the realized (and potentially significant) effect on cavity-nesters and other birds.

It may take 60-100 years for stand-structure diversity to develop within the stands that are currently in a mid-seral stage, as it would be highly unlikely that any "habitat enhancement" silvicultural treatments would be possible on most of the landscape.

The risk of long-term impacts to fish habitat is reduced under Alternative 4. However, because Alternative 4 does not allow harvest within the RMZs, it may delay recovery of "older forest conditions" in riparian areas. This means that the second growth forest stands may be overstocked with small diameter conifer trees for an extended period of time.

Alternative 4 will reduce commercial productivity and options by preventing aggressive treatments to improve stand vigor and reduce structures that are conducive to forest insect and disease activity. However, the ecosystem is not threatened. Alternatives 4 and 5 also have almost no capacity for land managers to prevent adverse negative effects of forest pests on adjacent forest lands. If pest activity develops on state lands, there will not be a way to reduce its impact or prevent activity on adjacent lands.

Energy Resources: With no subsurface directional drilling allowed from adjacent parcels, then any future oil and gas leasing activity within the watershed would effectively be eliminated.

Timber Resources: Delays in the extraction of timber are expected until trees reach rotation age of 200. A high reduction in average site index for lands available for harvest will occur with subsequent reductions in yields per acre. Retention harvesting reduces wood yields relative to even-aged systems, especially clearcutting. These reductions include volume in structures permanently retained and reduced growth of the regenerated stands due to effects of the residual overstory (Franklin 1997). See Table 7 under Alternative 1 for cumulative effects to the timber resources.

Similar to Alternative 3, higher levels of retention offer an opportunity to produce larger trees with higher quality wood characteristics than those managed on shorter rotations. In order to extract value from larger wood, equipment capable of removing the logs will have to be larger with subsequent higher logging costs. Current manufacturing processes and wood products design have been encouraging utilization of small dimension logs by local mills in the region. The financial value of larger and higher quality logs may be offset by the costs of hauling wood to mills that have not been retooled for smaller wood.

Environmental Health: Risk of slides, flooding and/or debris flow would be reduced under this alternative because of the elimination of new roads on unstable and potentially unstable slopes.

Land and Shoreline Use: Alternative 4, relative to commercial forest use, will favor establishment of shade-tolerant species such as hemlock and cedar. Some loss of conifer growth will occur as problem species that are not readily controlled by manual means out compete conifer species. This will be more significant on lower elevation, higher site stands where brush competition is more problematic and difficult species flourish. Stocking levels where natural seeding is employed are expected to involve higher densities of hemlock than those established for Douglas-fir stands on comparable sites. Precommerical thinning and other activities that reduce stand densities will be the most important intermediate treatments, especially on low-site stands that tend to stagnate. Opportunities for commercial thinning of hemlock stands are limited by thin bark and high damage susceptibility. Large areas will have no vehicular road access which will significantly increase the cost of all silvicultural activities, or prevent them.

Transportation: Since the harvest rotation is increased to 200 years, road construction would likely be spread out over a longer period than in Alternatives 1-3, as well. If construction occurs evenly over the 200 years, there would be about 1 mile of new road built in the first decade. Approximately 24 miles of new road would be constructed to complete the overall network. The number of miles of road to be abandoned will be determined after completion of a Road Maintenance and Abandonment Plan. The requirement of building bridges to cross all type 1-4 streams would substantially increase the number of bridges requiring inspection and maintenance. Overall road miles will be less, however, reducing other maintenance costs.

Public Services & Utilities: Alternative 4 dedicates 93 percent of the land's productive capacity for ecological and social benefits (as compared to over 50 percent in Alternative 1). (Hulsey, 2002.) This will impact local fire districts, counties and school construction.

Alternative 5 (3.3.5)

Areas of state trust lands specially constrained under Alternative 5 are shown on Map 5a.

Alternative 5 is a restoration alternative that does not focus on revenue generation. This alternative was developed by the Committee in response to comments received during the EIS scoping process. The initial focus of this alternative is on accelerating the development of old forest conditions and/or important cultural vegetation through strategic restoration thinnings. Restoration thinning includes introducing species and structural diversity into previously managed stands through plantings and variable density silviculture treatments that also retain unthinned areas and include small open patches. The long-term goal would be to create a forest that achieves a general, dynamic balance so that no further silvicultural activities would be required.

This alternative precludes (1) most timber harvest, except restoration thinnings designed to accelerate the development of old forest conditions and/or important cultural vegetation; (2) all new road construction; (3) all road reconstruction, except where needed to carry out restoration practices; and (3) new communication lease sites. This alternative also limits public access to aquatic, riparian, and wetland areas to pedestrians only.

Alternative 5 is not intended to meet the requirements of E2SSB 6731 regarding consistency with the sustained yield established by the Board of Natural Resources (Objective 11). Although many of the strategies are the same as those in the previous alternative, Alternative 5 relies more heavily on Objective 18 regarding alternative mechanisms to generate revenue. The analysis summary below only addressed those topics where meaningful differences are expected.

Earth: Potential impacts from slope instability along existing roads would be similar to Alternatives 1, 2, 3 and 4. Any risk of impacts from new roads would be eliminated. Localized surface erosion resulting from timber harvest on stable slopes would be reduced from Alternative 4 proportionally to the 45 percent reduction in harvest area, and would occur only where mineral soil was exposed by log skidding and other harvest activities. The cumulative impacts from implementation of this alternative would be the least of all the alternatives. Most of the sediment deliverable to public resources would originate from existing roads within the area.

Water: Similar to Alternative 4.

Plants and Animals: It could be assumed that the long-term trend in seral stage distribution for Alternative 5 would be the most similar to Alternative 4, due to the higher level of restrictions under the latter. One key difference for Alternative 5 would be a more rapid elimination of early seral stages across the landscape (the predicted timing is unknown, since no analysis was conducted).

The contribution to wildlife from the limited amount of "restorative thinning" that would be possible under this alternative is questionable, particularly when so many surrounding stands would not be available for treatments. Some of these surrounding stands might benefit from variable silvicultural treatments.

Alternative 5 would be more likely to retain a prominent hardwood component on the landscape, at least in the short-term. This alterative does not specify an accelerated conversion of mature hardwood stands, although it could be interpreted that some conversion might be accomplished through "restorative thinnings". See Table 7 under Alternative 1 for cumulative effects to the timber resources.

A key (short-term and long-term) difference for Alternative 5 compared to Alternatives 3 and 4 is the fact that it would only require surveying following PHS guidelines in areas where thinnings are planned. This would be more efficient than Alternatives 3 and 4, and would have less of an impact on personnel resources. This would, in turn, make it more likely to provide effective mitigation for some species of interest, such as the northern goshawk and pileated woodpecker.

Therefore, the impacts from roads, including human disturbance, would be dramatically minimized, and eventually even reversed under Alternative 5. This would have a positive impact on many wildlife species, including interior forest species.

Stands will age, become more structurally complex, and become less dominated by Douglas-fir over time. Concentrations of logs and snags will increase. There may be cases where specific resources or habitats or structures are threatened by a native insect or disease, but the general ecosystem is not at risk.

Under Alternative 5, the initial focus is on accelerating the development of old-forest conditions and/or important cultural vegetation, through strategic thinnings. This alternative will maintain the highest level of protection of the RMZs and consequently have the highest success in protecting riparian ecosystem function. Because this alternative does not allow harvest, it could limit the rate of recovery of "older forest conditions".

Timber Resources: Almost no timber resources are available under this alternative.

Carbon Sequestration: The rate of carbon sequestration is highest in younger trees. Under Alternative 5, with the exception of some restoration harvest, the forests would likely provide a long-term sink for atmospheric carbon. Restoration harvests would provide some young trees that would more actively remove additional carbon from the atmosphere.

Environmental Health: Significant debris flow events occurred along the incised channels prior to development of the area. Some of the flows were larger than those that have occurred since the initiation of timber harvest. Regardless of the effectiveness of mitigation efforts, damaging, destructive debris flows will continue to occur in many of the drainages in the planning area. There will be a continuing threat of property damage and potential loss of life to people occupying the channels and alluvial fans of these drainages.

Land and Shoreline Use: Current visual impacts from forest management activities will be substantially reduced over time, resulting in positive cumulative results for those who dislike seeing such activities.

Access throughout the area by recreational users (horse rider, hiker, mountain biker) will likely be further diminished due to the abandonment existing roads and/or the reduced amount of new roads. Users may be more concentrated on fewer trails or roads. Concentrated use may require additional management or maintenance of roads or trails to reduce erosion and sediment impacts, particularly at stream crossings.

Protection of cultural resources is the same as Alternative 3, although additional cultural resource properties would be incidentally protected through increased natural resource preservation.

Transportation: The transportation system, under Alternatives 1, 2, 3 and 4, is in place primarily for commercial forest management, with some use allowed for leases and recreation. The nature of road system needed for this restoration and maintenance proposal is not fully outlined. For example, will roads be maintained in some locations for recreational access or fire suppression even though not needed for silvicultural activities? The funding source for road working is not addressed in this alternative.

Alternative 5 requires abandonment of existing moderate- to high- risk roads on unstable and potentially unstable slopes. Since re-routing these road segments in a new location would not be allowed, this would render any roads beyond these points inaccessible. It would dictate abandoning not only the segment of road on unstable or potentially unstable slopes, but also all roads beyond that point. The Lookout Mountain mainline, Olsen Creek mainline, and the H-4000 road off of Park Road would be almost entirely abandoned. Abandonment of road systems with existing easements would prevent further road access to neighboring property or for utility maintenance.

Since many miles of roads would be abandoned under this alternative, it would take a substantial effort to finish work by the two-year deadline. Without additional budget, this would draw DNR resources away from other maintenance and abandonment projects outside the watershed, increasing the potential for damage or failure to roads to occur in other locations.

Public Services & Utilities: There is no objective, under Alternative 5, to produce income for the trusts through timber harvest. One hundred percent of the land's productive capacity is dedicated for ecological and social benefits, with any revenue being incidental to silvicultural activities associated with habitat enhancement. Elimination of timber harvest and the limitation of communication site leases to currently existing sites would greatly reduce revenue to the trusts, if no reliable alternative source of income is identified.

Comparison of Impacts:

A comparison of impacts among the alternatives has not been developed for the PDEIS, since the purpose of this document is expanded scoping (i.e., gaining information and comments relative to potential alternatives or individual components of alternatives). This information will be used to develop a preferred alternative. The set of alternatives carried forward into the Draft EIS may differ from the PDEIS, based on the input from this expanded scoping. A comparison of the impacts among the new set of alternatives will be included in the Draft EIS, comparing each alternative in that document to the preferred alternative.